Astrophysical Bulletin 2011 vol.66 N4, pages 449-459

Analysis of spectra of V471 Tau and HD 115404

Shimansky V., Bikmaev I., Shimanskaya N.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

We analyze the chemical composition of the atmospheres of a single K-type star HD 115404 and the secondary component of the V471 Tau variable. We use the technique of modeling of synthetic spectra to analyze the high-resolution spectra of these stars, taken with the RTT 150 Russian-Turkish telescope and find the abundances of 23 and 17 elements in the atmospheres of HD 115404 and V471 Tau, respectively. We demonstrate the lack of composition anomalies in the HD 115404 and show it to be consistent with the published data, inferred from equivalent widths of spectral lines. We find the abundances of 15 elements from Na to Ba to be consistent with the metallicity of the atmosphere of V471 Tau ([Fe/H] = -0.22 ± 0.12dex), which differs significantly from the average metallicity of the Hyades cluster. We show the existence of strong carbon and oxygen overabundances (by more than 1dex) due to the enrichment of the secondary by the nucleosynthesis products during the common-envelope stage of the system. On the whole, we demonstrate that V471 Tau and the other precataclysmic variables share similar composition anomalies. © 2011 Pleiades Publishing, Ltd.

http://dx.doi.org/10.1134/S1990341311040079

Keywords

stars: dwarf novae, stars: individual: HD 115404, stars: individual: V471 Tau, stars: variables: general